Chess endgame news

Article

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CHESS ENDGAME NEWS

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What is 'the chess endgame'? Fine (1952) saw no clear boundary between the middle and endgame phases of chess but it is clear that he intended the endgame to follow the middlegame permanently rather than temporarily. Speelman (1981) suggests that neither side should have more than 13 points but this would imply that the 'middlegame' KQRPKQR could follow the endgame KRPPKRP.

The chess endgame is deliberately defined elastically here as that set of positions which are amenable to definitive analysis using only data and/or algorithms without chessic insight. This now includes the vast majority of sub-8-man (s8m) positions (Bleicher, 2013a; ChessOK, 2013; MVL, 2012), positions with sufficient blocked or facing pawns of restricted mobility (Bleicher, 2013b; Romero, 2012), and clear wins within reach of forward-search. How frequently do games and studies reach the chess endgame as defined in this way? In practice, the answer depends on what computer resources are available to the likes of FREEZER, FINALGEN and your favourite chess engines. Table 1 gives a partial response, indicating the number of games and studies with *n*-man positions and/or which are accessible in theory if not in practice to FINALGEN.[2]

		#/% of instances with n-man positions							… also in the 'FinalGen' zone				
		2m	3m	4m	5m	6m	7m	8m	6m	7m	8m	9m	10m
1	**Large Game Database**	251	1,380	4,075	12,488	22,784	36,282	50,846	21,019	32,231	43,155	53,584	64,054
		0.1%	0.3%	0.9%	2.9%	5.2%	8.3%	11.7%	4.8%	7.4%	9.9%	12.3%	14.7%
2	**FIDE 2013 World Cup**	3	7	11	28	40	55	74	35	46	58	66	78
		0.7%	1.6%	2.5%	6.4%	9.2%	12.6%	17.0%	8.0%	10.6%	13.3%	15.2%	17.9%
3	**HHdbIV Studies Database**	22	1,898	11,809	29,396	37,310	37,512	31,507	22,273	20,957	17,329	13,970	11,013
		0.0%	2.5%	15.5%	38.6%	49.0%	49.3%	41.4%	29.3%	27.5%	22.8%	18.3%	14.5%

Table 1. Frequency of games/studies featuring *n*-man positions and/or being in the 'FINALGEN' zone.

The FIDE 2013 World Cup in Tromsø was relatively rich in endgames, perhaps because the increased pressure of the knockout format and the brisk tempo of tie-breaker games increased the expectation of an error from the opponent. Table 2 highlights some games, including six '7-man' games which were balanced enough to play out to a result other than their 7-man theoretical value. They comprise two draws lost, three wins drawn and one win converted into a loss possibly by a finger-slip. Bacrot-Moiseenko illustrates that requiring the opponent to find the unique winning move may be more effective than playing DTM-optimally.

Six KRPPKRP and two further KR(B/N)KR endgames were successfully defended, once again raising the question 'What is the most aggressive move and resolute defence in a drawn position?'. This is of interest to endgame experts including Karsten Müller (2013) and can be addressed by identifying the fallibility of one's opponent, especially if given an EGT of draws showing those of finite DT(C/Z)-depth (Haworth, 2003).

Game		7-man					
Rnd.	**Players**	**endgame**	**from**	**Eval**	**featured position**	**Res.**	**Notes**
1.1	Kaidanov-Areshchenko	KRPkrpp	53w	=	7R/8/6p1/8/5pkP/7r/5K2/8 w - - 0 82	0-1	**82. Rg8??** {82. Rh6"" =}
3.8	Vitiugov-Morozevich	KRPkrpp	52w	=	8/8/5p2/r1P5/4kp2/8/5K1R/8 w - - 0 53	0-1	**53. Rh5??** {*dtm* =29; 53. c6/K(f1/g2) … =}
2.4	Bacrot-Moiseenko	KRPkrpp	74w	0-1	8/8/8/6p1/4p1k1/P6r/R7/5K2 w - - 0 74	=	**74. a4** {-12m but requiring 74. … e3"" } **Rh1?? =**
6.2	Kramnik-Vachier-Lagrave	KRNPPkr	61b	1-0	1R3N2/5k2/8/6P1/8/4K3/8/5r2 w - - 0 62	=	**62. Ke4?? =** {62. Nd7"" } … and drawn in KRNKR
1.2	Ipatov-So	KRPknpp	40w	1-0	8/8/6R1/2p4p/4k3/6Pn/4K3/8 w - - 0 40	=	**40. Rf6?? =** {draw thereafter; 40. Rc6"/Rh6 win}
2.3	Fressinet-Malakhov	KRPPkrp	57w	1-0	8/2r5/8/6R1/3k1Pp1/6P1/2K5/8 w - - 0 59	0-1	**59. Kb3?? =** {59. Kb2"" wins }
1.1	Shirov-Hou	KRPPkrp	63b	=	8/5p1k/r7/3R1PPK/8/8/8/8 b - - 0 63	=	KRPPKRP draw thereafter
1.4	Riazantsev-Felgaer	KRPPkrp	57b	=	8/r3k3/7R/2K3p1/8/4P1P1/8/8 b - - 0 57	=	KRPPKRP draw thereafter
1.4	Movsesian-Hammer	KRPPkrp	44b	=	8/8/6kp/8/6PR/3r4/5PK1/8 b - - 0 44	=	KRPPKR draw thereafter
1.2	Felgaer-Riazantsev	KRBkrpp	63w	=	8/8/8/5k2/2R5/3r2BK/8/8 b - - 0 111	=	KRBKR draw thereafter
3.4	Le-Grischuk	KRPPkrn	51b	=	8/R6n/7r/6k1/8/5K2/8/8 w - - 0 64	=	KRNKR draw thereafter

Table 2. Some highlighted games from the FIDE World Cup, Tromsø 2013.

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[2] The FINALGEN zone ≡ endgames with neither side having more than one piece.

Unfortunately, as the definition of 'chess endgame' here currently excludes some positions with castling rights and/or lone Kings, it is not possible to say simply that it includes all of sub-8-man chess. As the curate-collared Alan Bennett (1961) said in his famous sermon when comparing life to a sardine tin, 'There's always a little bit in the corner that you can't get out'. However, this only encourages a request here for 6-1 EGTs and EGTs with castling rights.[3] Also on the wish list are DTC/Z EGTs with depth in plies rather than winner's moves,[4] DTC/Z EGTs identifying finite-depth draws as mentioned above, and self-identifying EGTs with an interface allowing their combined use in endgame strategies such as $SV^{+}M^{-}C^{-}Z^{-}$.[5]

Figure 1 completes the 'MVL' DTM-minimaxing line (Haworth, 2013a) for the 549-move win from the maxDTM KQPKRBN position *p1w*, 1n1k4/6Q2/5KP1/8/7b/1r6/8/8 w. Zakharov (2013) reports that the position is essentially unique, the two other equally deep positions having the rook on b1/b2 instead of b3.

The endgame phases start in KQPKRBN until **6. g8=N+**"" where the necessary 'underpromotion' gives check, prevents Bxh8 and sets up the marathon. Then 503 moves follow in KQNKRBN until White wins the exchange with **509. Qxb7**" **Kxd4**". There are 30 moves in KQKBN until **539. Qxa6**" and 10 moves in KQKB until **549. Qg6#**". The complete line with move-uniqueness annotated[6] is available online (Haworth, 2013b). Some 13.2% of White's best moves are 'uniquely winning' and a further 72.9% are 'uniquely DTM-optimal'. Some 85.8% of Black's best moves are unique DTM-optimals. The author's FRITZ10 with s6m DTM EGTs and searching to 14 plies, earned a 50m-draw but lost a knight on move 53 and was mated on move 66. Perhaps a human player could meet the challenge of getting a 50-move draw here against a computer but it seems unlikely.

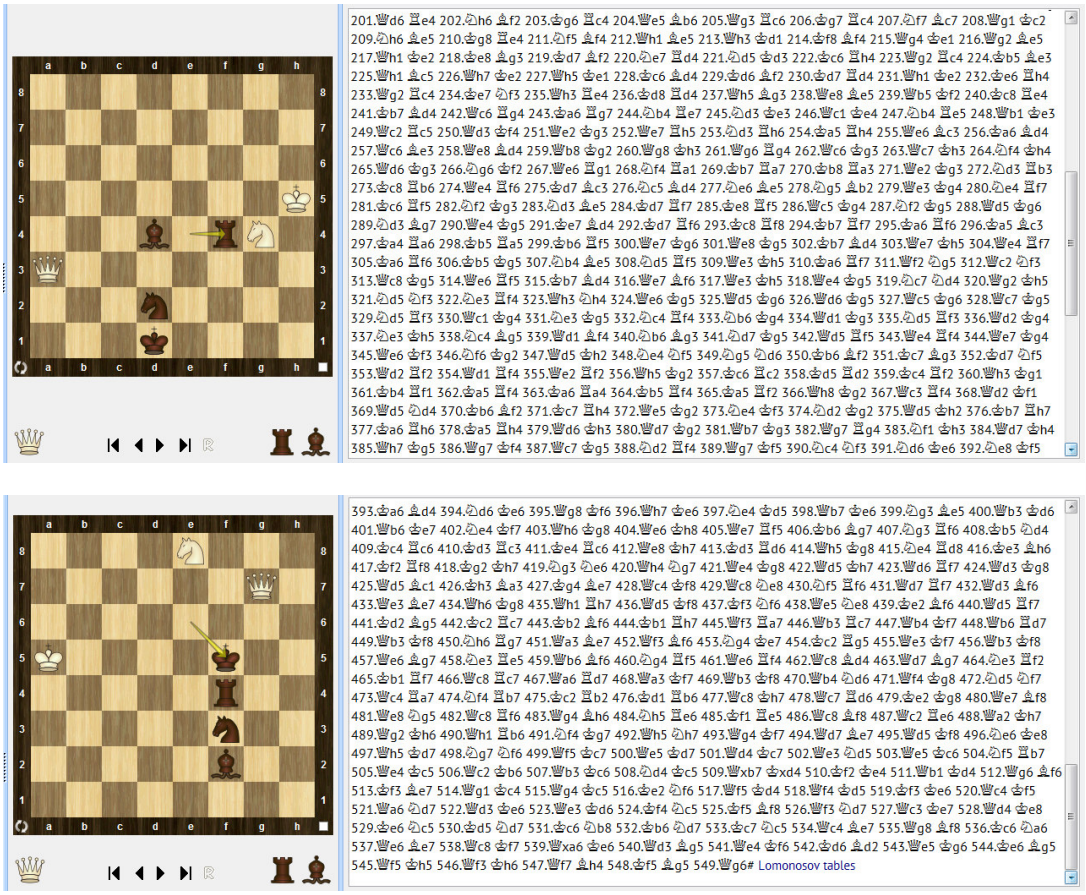

Figure 1. Moves 201w-392b and 393w-549w of a maxDTM sub-8-man maxDTM win.

[3] Each fixed piece reduces the EGT size by ~60 so the challenge in creating them is in their indexing rather than their size.

[4] 7r/3Q4/8/8/2k1Nr2/6K1/8/8 b: *dtc* = -50m but the known line is 101 plies long. A DTC EGT measuring depth in winner's moves cannot distinguish between losses in 101 and 100 plies. The question is 'Is there a win in 100 plies?'

[5] $SV^{+}M^{-}C^{-}Z^{-}/SV^{+}M^{+}C^{+}Z^{+}$: White/Black preserve position-value; White minimizes DTM, DTC, DTZ in that order etc.

[6] ° ≡ only available move, "" ≡ only value-retaining move, "' ≡ 'obviously' the only move progressing the win, " ≡ only strategy-optimal move, and ' ≡ a non-unique strategy-optimal move.

A first tranche of Lomonosov EGT statistics is now to hand (Zakharov, 2013) in the form of some 3,500 DTM-depth profiles and maxDTM positions for s8m endgames. Separate statistics have been provided for each of six slices for P-ful endgames, the slices corresponding to the rank of the most advanced Pawn. The DTM-deepest P-less s8m positions are in KRBNKQN: 8/6R1/8/6N1/3k1K2/1B6/7n/7q w is one of 24 losses in 545 moves.

Some footnotes to (Haworth, 2013a) can be added about record games. Nikolić - Arsović (Chessgames, 2013) is not as previously stated the longest known game but it is the longest non-computer game recognised as 'meaningful'. It also includes the latest available theoretical win.[7] CHESSBASE (2013) actually contains a longer drawn game of 279 moves - Ugur - Cammann from the German U10 Championship in 2000. At position 68b, this arrives at KP(h3)KP(g3)P(h4) 8/8/8/8/5k1p/6pP/6K1/8, which is in fact drawn with either side to move. Thereafter, the Pawns do not move, position 70b is repeated at 72b and 82b, and the Black King explores the whole board to absolutely no purpose whatever for another 211 moves. One wonders what the players' knowledge and motivations were: did they know about the repetition and 50-move rules, was someone attempting to win on time, or was this a deliberate attempt on the longest-game record? The 1971 Finnish Open Championship drawn game Ristoja - Nykopp is said to have been a prearranged 'fun' game of 300 moves and is not available.

The rule for Bionic Games should have been stated as 'Computers make *n*-move draw-claims as available unless the position is decisive according to a credible endgame table.' Krabbé (2006) recognises the WBEC 2005 game JONNY_2.82_X64 - NEJMET as the longest meaningful decisive computer game at the time (Bonham, 2006). It ran to 295 moves when White resigned at 8/7r/KP6/4r3/8/5Q2/6p1/7k b: Black has mate in 15 (MVL, 2012), defining an extrapolated game of 309 moves.[8] Even longer games have gone unrecognised on chessic grounds or because of software bugs which affected the game-result. 7k/8/8/8/8/7P/BK5P/8 w or similar has been seen on the board, is obviously drawn but can run to 400 moves: Krabbé notes that, in the same vein, NEJMET_3.07 - GOTHMOG_1.0B10 (2004) was a 375-move and could have been a 475-move draw. He somewhat ruefully anticipated the 500-move computer-game which may have been achieved by now. A retrograde challenge here is to create a credible prelude to a deep endgame positions such as the rather natural KQPKRBN position *p1w*.

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[7] 255w, KRBKR, 8/8/8/3B2r1/k2K4/8/7R/8 w (*dtc/z* = 20, *dtm* = 26), $SV^{+}M^{-}C^{-}/SV^{+}M^{+}C^{+}$: 255. Rh3"" Kb5' 256. Rb3+"" Ka4" 257. Kc4" Rg4+' 258. Kc5"" Rh4" 259. Rc3' Ka5" 260. Ra3+" Ra4º 261. Rb3" Rg4" 262. Rb2' Rh4" 263. Rb7" Rh6" 264. Bf7" Rf6" 265. Bc4" Rf5+" 266. Bd5"" Rf6" 267. Rb5+" Ka6" 268. Rb3' Ka7" 269. Rb7+" Ka6" 270. Re7" Rf5" 271. Re8" Rxd5+" 272. Kxd5" {KRK} Kb6" 273. Rc8' Kb5' 274. Rb8" Ka5" 275. Kc5' Ka4" 276. Rb5' Ka3º 277. Kc4" Ka4' 278. Rd5' Ka3º 279. Rd2" Ka4º 280. Ra2#" 1-0.

[8] $SV^{+}M^{+}/SV^{+}M^{-}$: 295. … Rh6" 296. Ka7' Ra5+" 297. Kb7" Rb5" 298. Qe3" Rbxb6+" {KQKRRP, *dtm* = -11} 299. Qxb6" Rxb6+" 300. Kxb6" g1=Q+" {KKQ, *dtm* = -9} 0-1.